

PURGING OF DOT CYLINDERS

PROPANE SAFETY MEETING OUTLINE

Summary

This outline covers procedures for purging U.S. Department of Transportation (DOT) portable cylinders and forklift cylinders of less than 101 lb. LP-gas capacity. These procedures also apply to Interstate Commerce Commission (ICC) cylinders that have been properly maintained and requalified.

Who should attend

- Bobtail drivers
- Cylinder plant employees
- Customer service representatives (front office staff)
- Cylinder delivery truck drivers

NOTE: Employees in these job categories who do not attend this meeting should be trained on this subject as soon as possible.

Key codes and standards

National Fire Protection Association (NFPA) 58, LP-Gas Code (2008 edition), §7.3.2 [Purging]

Company Standard Operating Procedures (SOP)

Note any additional materials used on the attached documentation form, or indicate not applicable.

A company SOP may provide information to cylinder customers regarding proper supervision and training of customers' employees who purge cylinders or perform other LP-gas activities.

Documentation

Complete the attached documentation form listing the date, time and location of the safety meeting and the printed names and signatures of the attendees, name of persons who should have attended but did not, and copies of any materials distributed, video shown, or visual aids used in the demonstration. These materials should be properly filed in a safe location.

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PURGING DOT CYLINDERS

PROPANE SAFETY MEETING HANDOUT

Cylinders should be purged only by trained certified personnel using proper safety procedures.

Why Purge Cylinders?

Purging expels air from a cylinder.

New cylinders and cylinders that have been opened to the atmosphere must be purged with vapor or evacuated before they are filled with liquid propane. A new cylinder that has not been properly purged cannot be filled to its proper filling level, and propane that is mixed with air has reduced heating value.

From a safety standpoint, purging is important for two reasons:

1. **Purging helps prevent releases of a combustible mixture.** Air and propane do not mix well under cylinder pressure, and the combined pressure of propane vapor and air may momentarily cause the cylinder's relief valve to vent a combustible mixture.
2. **Purging helps prevent "odorant fade."** If air is present inside a steel cylinder, rust (iron oxide) particles may form on the interior surface. Rust particles can absorb the propane odorant, ethyl mercaptan. By purging the cylinder with vapor, the "binding" action of the iron oxide is confined to the vapor that is expelled during purging, thus ensuring the effectiveness of the odorizing agent to warn of a possible leak in the customer's piping system.

Some cylinder fillers believe they have properly purged a cylinder by merely opening the fixed maximum liquid level gauge on the OPD valve during the initial filling of the cylinder. This process does not properly purge a cylinder. Proper purging can be done using the vapor method or the pump method.



Vapor Purging

Figure 1 illustrates one way of purging cylinders with vapor. After expelling air from the cylinder by opening valves 1 and 3 with valve 2 closed, vapor at 15 psig can be introduced into the cylinder by closing valve 1 and opening valve 2, with valve 3 open.

NOTE: A 3-way valve may be used instead of three separate valves.

By alternately opening valves 1 and 2 five times, charging the cylinder with propane vapor to 15 psig, each time allowing the gas/air mixture to vent until the cylinder pressure reaches atmospheric pressure, the cylinder will be purged of air and ready for liquid filling. A final vapor charge of 15 psig should be kept in the cylinder before introducing liquid propane.

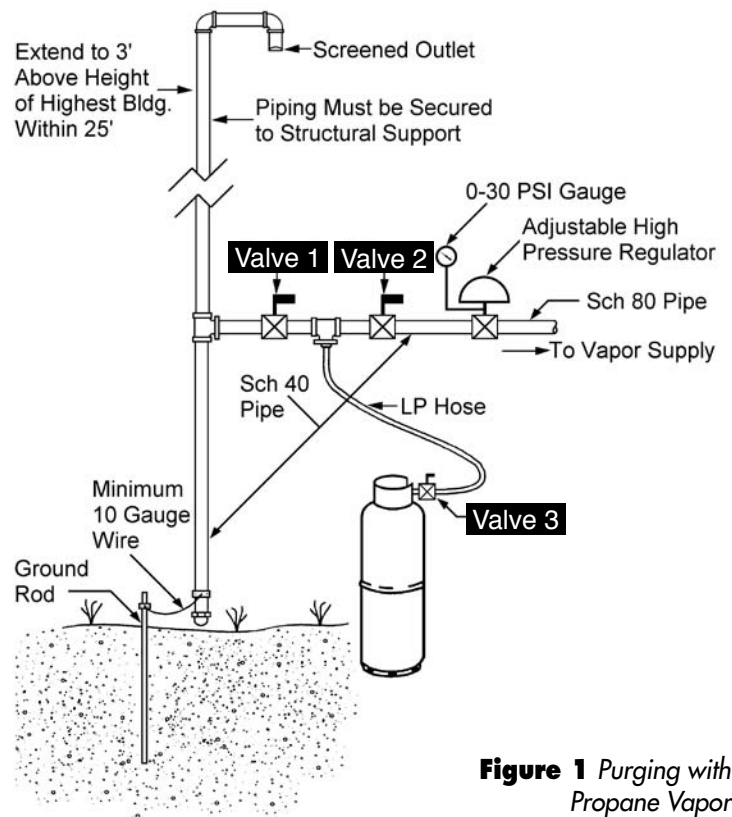


Figure 1 Purging with Propane Vapor



Figure 2 Sample Vacuum Purge Label
Courtesy Manchester Tank

Pre-Purged Cylinders

Several cylinder manufacturers ship some of their forklift cylinders pre-purged by vacuum. Figure 2 shows a typical label for a pre-purged cylinder. Purging of pre-purged cylinders is not necessary unless the cylinder has lost its negative pressure.

PROPANE SAFETY

RAILROAD COMMISSION OF TEXAS

Purge Pump Method

Many propane marketers and dispensing station operators use a purge pump to evacuate air from new cylinders equipped with OPDs. The purge pump method has become more common for two reasons: (1) some OPD designs involve extremely long purge times, and (2) using a purge pump decreases or eliminates the need to vent vapor to the atmosphere.



WARNING: Purge pumps must be used only on new cylinders which have NEVER contained any flammable substance.

Below is a picture of a cylinder purge pump. These units come in explosion-proof and non-explosion-proof models. However, even an explosion-proof pump may not be used to evacuate a cylinder that has contained any flammable substance. Explosion-proof pumps are used in restricted areas such as cylinder-filling rooms or within 25 feet of a propane transfer area such as a dispenser. If a non-explosion-proof unit is used as part of a dispenser operation, remember that it must be used away from the dispenser or any other area where a source of ignition is present.

Follow manufacturer's operating instructions. Read and follow all instructions and warnings in the equipment user's manual.

After air in the new cylinder has been evacuated according to the manufacturer's instructions, momentarily charge the cylinder with vapor before filling the cylinder with liquid.



Figure 3 *New Cylinder Air Purging Pump*

**PROPANE
SAFETY**

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PROPANE SAFETY MEETING DOCUMENTATION FORM

Topic:

Name of Company: Location:

City: State: Zip:

Date:

Instructor (Print Name) Instructor (Signature)

If applicable, Instructor's Company/Address/Telephone and Cell Telephone No.:

Materials used at meeting (Attach copies of any printed materials distributed)

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